UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/067,424	02/07/2002	Jeng Ping Lu	7447.0021-01	8498

22852 7590 04/03/2006

FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER LLP
901 NEW YORK AVENUE, NW
WASHINGTON, DC 20001-4413

EXAMINER	
RICHARDS, N DREW	

ART UNIT	PAPER NUMBER
2815	

DATE MAILED: 04/03/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/067,424	LU ET AL.	
	Examiner	Art Unit	
	N. Drew Richards	2815	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 January 2006*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *7-14 and 16-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *7-14 and 16-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *27 February 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 7-14 and 16-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over the applicant's admitted prior art (AAPA) in view of Ishaque et al. (USPAT 5288989, Ishaque) and Possin et al. (USPAT 5777355, Possin).

With regard to claim 7, the AAPA discloses in figure 2 a method for making a high fill factor image array (40). The AAPA discloses in figure 2 providing a plurality of source-drain metal contacts (44) on a substrate (42). The AAPA discloses in figure 2 depositing a first passivation layer (56) over the plurality of source-drain metal contacts and the substrate. The AAPA discloses on page 2, lines 19 – 20 that a preferred material for the first passivation layer is silicon oxynitride. The AAPA also discloses on page 3, lines 11 – 18 that an interface with the silicon oxynitride and an overlying layer causes conducting channels to occur between two lateral pixel electrodes. The AAPA further discloses on page 3, lines 19 – 21 a material different than silicon oxy-nitride as a first passivation layer is advantageous to prevent the conducting channels from forming between two pixel electrodes. The AAPA does not discuss using a particular different passivation layer. Ishaque teaches in figure 1 depositing a passivation layer that comprises depositing a first passivation layer (132) over underlying devices and

depositing a second passivation layer (134) over the first passivation layer, the second passivation layer (134) being thinner than the first passivation layer (132). It would have been obvious to one of ordinary skill in the art at the time of the present invention to use the dual passivation layer of Ishaque in the method of the AAPA in order to use a passivation layer that reduces capacitive coupling between device structures as is known in the art, reduces leakage, and provides a moisture barrier to the improved passivation layer as taught by Ishaque in column 7, lines 21 - 42. Further, any processing occurring after the deposition of the first passivation layer in the AAPA will now occur after the deposition of the first and second passivation layers of Ishaque. The AAPA discloses in figure 2 (taken together with the teaching of Ishaque) opening a plurality of via holes through the first and second passivation layers to the plurality of source-drain metal contacts. The AAPA discloses in figure 2 (taken together with the teaching of Ishaque) depositing a layer of conductive material (layer above arrow pointing out 46) over the plurality of source-drain metal contacts and the second passivation layer. The AAPA discloses in figure 2 depositing a first doped a-Si layer (48) over the layer of conductive material. The AAPA discloses in figure 2 patterning the first doped a-Si layer and the layer of conductive material to form the collection electrodes (46). The AAPA discloses in figure 2 (taken together with the teaching of Ishaque) depositing a continuous layer of i a-Si (50) disposed on the second passivation layer and the first doped a-Si layer. The AAPA discloses in figure 2 depositing a continuous second layer of doped a-Si (52) over the continuous layer of i a-Si. The AAPA discloses in figure 2 depositing an upper conductive layer (54) over the second layer of doped a-

Si. It is not clear if the AAPA and Ishaque teach patterning the upper conductive layer to form the image array. Possin teaches in figures 1 and 2; and in the abstract depositing and patterning an upper conductive layer (28). It would have been obvious to one of ordinary skill in the art at the time of the present invention to use the patterning step of Possin in the method of the AAPA and Ishaque in order to differentiate the device into a plurality of devices, thus creating an array, which results in cost savings over having to make a plurality of devices separately. It would have been further obvious in the method of the AAPA in view of Ishaque and Possin that the patterning would form an image array.

With regard to claim 11, the AAPA discloses in figure 2 a high fill factor image array (40) forming process. The AAPA discloses in figure 2 providing a plurality of source-drain metal contacts (44) on a substrate. The AAPA discloses in figure 2 depositing a first passivation layer (56) over the plurality of source-drain metal contacts and the substrate (42). The AAPA discloses on page 2, lines 19 – 20 that a preferred material for the first passivation layer is silicon oxynitride. The AAPA also discloses on page 3, lines 11 – 18 that an interface with the silicon oxynitride and an overlying layer causes conducting channels to occur between two lateral pixel electrodes. The AAPA further discloses on page 3, lines 19 – 21 a material different than silicon oxy-nitride as a first passivation layer is advantageous to prevent the conducting channels from forming between two pixel electrodes. The AAPA does not discuss using a particular different passivation layer. Ishaque teaches in figure 1 depositing a passivation layer that comprises depositing a first passivation layer (132) over underlying devices and

depositing a second passivation layer (134) over the first passivation layer, the second passivation layer being thinner than the first passivation layer. It would have been obvious to one of ordinary skill in the art at the time of the present invention to use the dual passivation layer of Ishaque in the method of the AAPA in order to use a passivation layer that reduces capacitive coupling between device structures as is known in the art, reduces leakage and provides a moisture barrier to the improved passivation layer as taught by Ishaque in column 7, lines 21 - 42. Further, any processing occurring after the deposition of the first passivation layer in the AAPA will now occur after the deposition of the first and second passivation layers of Ishaque. The AAPA discloses in figure 2 (taken together with the teaching of Ishaque) opening a plurality of via holes through the first and second passivation layers over the plurality of source-drain metal contacts. The AAPA discloses in figure 2 (taken together with the teaching of Ishaque) depositing a layer of conductive material (layer above arrow pointing out 46) on the plurality of source-drain metal contacts and over the second passivation layer. The AAPA discloses in figure 2 depositing a first doped a-Si layer (48) over the layer of conductive material. The AAPA discloses in figure 2 patterning the first doped a-Si layer and the layer of conductive material to form the collection electrodes (46). The AAPA discloses in figure 2 (taken together with the teaching of Ishaque) depositing a continuous layer of i a-Si (50) disposed on the second passivation layer and over the first doped a-Si layer. The AAPA discloses in figure 2 depositing a continuous second layer of doped a-Si (52) over the continuous layer of i a-Si. The AAPA discloses in figure 2 depositing an upper conductive layer (54) over the

continuous second layer of doped a-Si. It is not clear if the AAPA and Ishaque teach patterning the upper conductive layer. Possin teaches in figures 1 and 2; and in the abstract depositing and patterning an upper conductive layer (28). It would have been obvious to one of ordinary skill in the art at the time of the present invention to use the patterning step of Possin in the method of the AAPA and Ishaque in order to differentiate the device into a plurality of devices, thus creating an array, which results in cost savings over having to make a plurality of devices separately. It would have been further obvious in the method of the AAPA in view of Ishaque and Possin that the patterning would form an image array.

With regard to claim 16, the AAPA discloses in figure 2 a method for making a high fill factor image array (40). The AAPA discloses in figure 2 providing a plurality of source-drain metal contacts (44). The AAPA discloses in figure 2 depositing a first passivation layer (56) over the source-drain metal contact. The AAPA discloses on page 2, lines 19 – 20 that a preferred material for the first passivation layer is silicon oxy-nitride. The AAPA also discloses on page 3, lines 11 – 18 that an interface with the silicon oxy-nitride and an overlying layer causes conducting channels to occur between two lateral pixel electrodes. The AAPA further discloses on page 3, lines 19 – 21 a material different than silicon oxy-nitride as a first passivation layer is advantageous to prevent the conducting channels from forming between two pixel electrodes. The AAPA does not discuss using a particular different passivation layer. Ishaque teaches in figure 1 depositing a passivation layer that comprises depositing a first passivation layer (132) over underlying devices and depositing a second passivation layer (134) over the first

passivation layer, the second passivation layer being thinner than the first passivation layer. It would have been obvious to one of ordinary skill in the art at the time of the present invention to use the dual passivation layer of Ishaque in the method of the AAPA in order to use a passivation layer that reduces capacitive coupling between device structures as is known in the art, reduces leakage and provides a moisture barrier to the improved passivation layer as taught by Ishaque in column 7, lines 21 - 42. Further, any processing occurring after the deposition of the first passivation layer in the AAPA will now occur after the deposition of the first and second passivation layers of Ishaque. The AAPA discloses in figure 2 (taken together with the teaching of Ishaque) opening a via hole through the first and second passivation layers to expose the source-drain metal contact. The AAPA discloses in figure 2 depositing a layer of conductive material (46) on the source-drain metal contact, such that the layer of conductive material makes electrical contact with the source-drain metal contact. The AAPA discloses in figure 2 depositing a first doped a-Si layer (48) on the layer of conductive material. The AAPA discloses in figure 2 patterning the a-Si layer and the layer of conductive material to form a collection electrode (46). The AAPA discloses in figure 2 (taken together with the teaching of Ishaque) depositing sensor material comprising a continuous layer of i a-Si (50) over the collection electrode and at least a portion of the second passivation layer. The AAPA discloses in figure 2 depositing a continuous layer of doped a-Si (52) over the continuous layer of i a-Si. The AAPA discloses in figure 2 depositing a conductive layer (54) over the continuous layer of doped a-Si. The AAPA discloses in figure 2 that the conductive layer is an upper

electrode. It is not clear if the AAPA teaches patterning the upper conductive layer to form the upper electrode. Possin teaches in figures 1 and 2; and in the abstract depositing and patterning a conductive layer (28) to form an upper electrode. It would have been obvious to one of ordinary skill in the art at the time of the present invention to use the patterning step of Possin in the method of the AAPA in order to differentiate the device into a plurality of devices, thus creating an array, which results in cost savings over having to make a plurality of devices separately.

With regard to claims 8, 12, and 17, the Ishaque teaches in figure 1 and column 5, lines 15 – 29 wherein the first passivation layer comprises BCB.

With regard to claims 9, 13, and 18, Ishaque teaches in figure 1 and the abstract wherein the second passivation layer is an oxide.

With regard to claim 10, 14 and 19, Ishaque teaches in figure 1 and column 5, 52 – 53 wherein the second passivation layer has a thickness of about 1000 Å (i.e. the range of between about 400 Å and 1 micron encompasses the claimed range of about 1000 Å).

Response to Arguments

3. Applicant's arguments filed 1/13/06 have been fully considered but they are not persuasive.

Applicant has argued that the thicker first passivation layer of Ishaque is deposited on silicon. This argument is not persuasive. First, it is not well understood

how the first passivation layer being thicker in argued to be different than what is claimed. The claims recite the second passivation layer being thinner than the first, thus the first being thicker than the second. As such, this argument agrees with the rejection in that the dual passivation layer of Ishaque reads on the first and second passivation layer claimed. Second, it is not understood how the first passivation layer of Ishaque being deposited on silicon has any bearing on whether the rejection of the claimed invention is proper or not. The combination as applied in the rejection, does not rely upon any silicon layers being formed underneath the first passivation layer or not. In the combination, the first passivation layer 132 of Ishaque would be formed on substrate 42 and metal contacts 44 of figure 2 of the admitted prior art. This combination is the same as that claimed.

Applicant further argues that there is no motivation to use the dual passivation layer of Ishaque in the device or method of the admitted prior art. This is not persuasive. Multiple valid motivations were explicitly provided in the rejection that came from the prior art itself. Ishaque discusses various single layer passivation layers and the advantaged and drawbacks of each. Ishaque then discusses that the dual layer passivation relied upon in the rejections above satisfies all the requirements for the passivation layer and thus is advantageous for providing all the motivations or advantages simultaneously.

Applicant's argument that a moisture barrier is not needed is not persuasive. Applicant asserts that one skilled in the art would resist a good moisture barrier because of the desire not to trap moisture in the device. Applicant's arguments do not constitute

evidence on record and thus is mere allegation. This allegation is unproven or supported by any evidence and is thus not persuasive to overcome the *prima facie* obviousness of the rejection. Further, it is noted that the passivation layer of Ishaque is comprised of the same materials as in the instant invention (BCB and oxide as recited in claims 8, 9, 12, 13, 17 and 18 of the instant application), thus if the passivation layer of Ishaque would trap moisture in the device (an alleged disadvantage or undesirable effect), then applicant's invention would also include this undesirable characteristic.

Conclusion

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to N. Drew Richards whose telephone number is (571) 272-1736. The examiner can normally be reached on Monday-Friday 9:00-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Parker can be reached on (571) 272-2298. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

N. Drew Richards
AU 2815